

II. *Additional notes and observations on the life-history of*
Atypus piceus. By FREDERICK ENOCK, F.E.S.

[Read November 4th, 1891.]

SINCE I had the honour of bringing before the Entomological Society my notes on this most interesting spider, I have been enabled to confirm all my previous observations, and to add a few additional facts.

The most difficult point in the life-history is to settle the age to which the female arrives before and after maturity, for, owing to various changes, I have not yet succeeded in keeping and watching one colony of spiders beyond seven years; but I am in hope of having a chance of establishing a fresh colony this spring in a locality where the spiders will not be disturbed, and where I can label and keep exact record of each nest.

One very interesting fact I have established in connection with the age of the female. On October 15th, 1883, I dug up a large tube containing female and her family, which I carefully reset in a large flower-pot, where, on March 16th, 1884, the young spiderlings commenced to emerge, and look about for suitable sites for their future dwellings. The maternal home or tube had been put into thorough repair in October, and no doubt the walls had been relined from top to bottom with new silken tapestry, a task a spider seems to manage better than the "British workman," in spite of having a family of upwards of a hundred baby spiders to look after. After this mother had started her brood on their own account, she repaired the small aperture made by the exit of the family, and then settled down to apparent ease, comfort, and perfect health, enjoying an occasional meal of a blow-fly, until May 1st, 1886, when I could not rouse her; and, on breaking open the tube, and digging up the lower part, I found her dead, after having lived in solitude for more than two years since turning her brood out. On October 29th, 1886, I put six

females, with their broods of young, into various pots, the youngsters making their appearance on a warm, bright morning, April 20th, 1887, and the last widowed mother died April 14th, 1890, or close on three years after, a time sufficiently long for most spiders to become great-great-grandmothers.

Several of the offspring of these venerable females lived in health and strength for about two years, during which time they deepened their tubes several times in warm, moist weather, increasing the original diameter of a sixteenth of an inch to a bare eighth, also adding to the aerial part. One or two, after living in their tubes for two years, were found wandering about, and on May 9th had formed fresh tubes. The following August one colony was reduced to six tubes, and in another month the occupants had succumbed to the poisonous fumes from various ballast-heaps, which had been burning for several months. On digging up the tubes I found them to range from four to five inches long, and a little over an eighth of an inch in diameter.

On August 10th, 1888, I found one of the spiderlings, turned out April 25th, 1887, had thrown out from the aerial part of the tube its cast-skin, the first one seen after making its own tube; but the first *moult* of the young takes place in the hammock just before they break out into the maternal tube.

August 14th, 1888. Another of this brood had pushed out its cast-skin. May 16th, 1889, a two-year-old spiderling, in response to a *Chironomus* held to and kicking against the walls of the tube, came up, struck at and pulled the fly through, coming up a minute and a half later to repair the rent, which it did in a most finished manner.

May 23rd, 1889. Another two-year-old spiderling became dissatisfied with its abode, left it, and soon formed another of somewhat larger dimensions; and, later on, several of this brood did the same. I imagine the ground had become sour from imperfect drainage. Quite a number of the spiderlings commenced to deepen and enlarge their tubes in April; in fact, a general "spring cleaning" seemed to be going on all round.

On March 28th, 1890, I was pleased to find the young colony which I had established at Hampstead in 1886 were doing well, some of the tubes measuring a quarter

of an inch in diameter, the forsaken mothers still in good health, and with wonderful appetites for blow-flies whenever held against the tubes. One of the ancient spinster females, which I placed in a bell-glass April 8th, 1885, actually pushed out a cast-skin, apparently quite a recent one.

June 1st, 1890. One mother of 1887 had made a beautiful new aerial portion to her tube, and took a blow-fly for lunch. On the 9th all were exposed to very heavy rain, which flattened their tubes down. Next day each one had added a brand new top part, some of their brood doing the same, fully confirming my previous observation, that rain induces the spiders to strengthen and lengthen their tubes.

One of these females had carried her tube against and up the side of the bell-glass, and this one I kept covered and darkened, so that I could occasionally watch her movements; and I frequently noticed that, when a blow-fly was held outside her tube, she approached in the most stealthy and cat-like manner, seeming to glide rather than walk along; but, if disturbed, she pressed her legs against her sides, and literally shot back and down the tube with lightning-like rapidity; this spider, on being exposed to the rain and light the next day, had so thickened the silken lining of the tube against the glass as to completely shut out further observations.

August 25th. Heavy rain again battered and flattened down all the tubes, which remained in this condition until the middle of September, when several commenced to deepen and throw out the sand, afterwards improving the aerial portions, no doubt in anticipation of the male's visit; but whether those females, which had already had one family, could produce another, is one of the facts I am anxious to settle. Some of these females had carried the aerial portions of their tubes to a length of 4 in. up the sides of the pots, but these were far surpassed by some found at Hampstead on September 7th, 1891, measuring respectively 4, 5, and 6, and one no less than $7\frac{1}{2}$ in. above ground, carried up the almost perpendicular sand-bank, and quite resembling Dr. McCook's tree purse-web spider, *Atypus niger*.

On July 6th, 1891, I paid a visit to Portland Island, where the Rev. O. Picard Cambridge had found *Atypus Blackwallii*, or what was considered to be the British

type. After a long ramble and search I was fortunate in finding a few tubes, which I dug up after considerable trouble, for the spiders carry them under the stones in old disused quarries, and then down for some depth among the grass-roots, rendering digging up without injury a most trying task. I examined the occupants most carefully, but could not satisfy myself that they were different to *Atypus piceus*; so sent some on to the Rev. O. P. Cambridge, who kindly replied, expressing his opinion that they were not *Atypus Blackwallii*, but agreed in every respect with his Bloxworth *A. piceus*, as well as with the specimens which I had sent to him from Hampstead. Some days after I had a good day's sport, and found this hitherto considered rare spider in the greatest profusion, the tubes in some spots surrounding every piece of loose stone; in one instance as many as fifteen large tubes around one piece of stone not more than a foot square! I also found quite a number of tubes containing the beautiful hammock of eggs, in every case slung up in the cavity on the upper side, never on the lower, a wise provision of Nature, for the lower side is the main thoroughfare, up and down which the spider runs to and from the aerial portion, thus avoiding treading upon the fragile hammock of eggs. Many of the eggs were found just hatching, others were more forward, and the young spiderlings had left their first suit of baby clothes in the hammock.

I was fortunate in finding a number of immature males in their own tubes, all of which were of one character—of about three-eighths of an inch diameter, seven or eight inches long, and parallel from top to bottom. The spiders, when turned out, were of a much lighter colour, and far more active than the females. These I placed in various pots, where they very soon settled down, making fresh tubes amongst the moss. On Sept. 6th I examined them, and found five had matured, one having only just cast its skin, being quite white and weak. All appeared much smaller than those found at Woking and Hampstead. I sent one to Rev. O. P. Cambridge for further identification; he replied that he was sorry to say they were identical with the others, viz., *Atypus piceus* of Sulzer. The following day (Sept. 7th) I went up to Hampstead, and found the largest mature male I have ever seen; besides the largest tube of a female, viz., $15\frac{1}{2}$ in long from top to bottom.

As regards the feeding habits of this spider, I have not much to add; but one interesting experiment might be mentioned:—On July 22nd, 1888, a warm, sultry morning, after heavy rain the previous night, all my home colony had distended their tubes, and made them as attractive as possible to all inquisitive flies. I caught one, and held it to the longest tube; the spider came up, seized it, and dragged it through and down. I quickly caught another blow-fly—held it to the same tube; the spider, coming up to repair the hole, but finding another fly there, she seized it and dragged it through the hole already made, and down to her larder. I immediately caught another blow-fly, and as quickly held it to the hole; and again the spider came up, seized it, and disappeared. I did the same up the garden for another blow-fly, and before the spider had returned another fly was ready for her, which she soon observed and seized. I returned to look for another blow-fly, and ran back with it, and for the fifth time the spider seized and dragged her prey down; and for the sixth time I ran to look for another meal, and back again in double-quick time. The spider did not keep me waiting long, and was evidently getting a little puzzled, and, like myself, *excited*; however, she took the fly, and I departed once more and managed to capture another victim, reaching the tube just in time to offer it. It was not refused, but snapped at and pulled down; and I hurried away and back again with one more fly, and the spider again accepted it with a snap of her jaws, retiring gracefully backwards, and I forwards to catch another blow-fly; this I did, and once more was in time for the spider, who seized this the ninth blow-fly with lightning-like rapidity, and disappeared. I ran and searched for another fly, but, as may be imagined, they had been so frequently disturbed that I had difficulty in obtaining one; and when I returned to the tube the wily spider had completely covered in the rent. I continued to knock with the blow-fly, and the spider came up, pulled the tube in, and *held* it, as much as to say, “I have had enough, go away”; and I went, wondering much what she would do with nine blow-flies. Next morning she had thrown five sucked skins out! The time occupied in this great repast was just 45 minutes.

On Sept. 7th, 1891, one of the very large tubes dug up

contained a living beetle (*Nebria* — ?) without any elytra, both apparently having been bitten off by the large female *Atypus*, which was dead, and its abdomen a heaving mass of minute maggots. I am inclined to think the *Nebria* had forced its way into the tube, and, not agreeing with the owner, they had come to, not blows, but *bites*; and I imagine the spider had managed to pinch off the elytra, and in return the *Nebria* had given the spider a fatal nip in its abdomen.

The various photographs illustrative of the life-history of *Atypus piceus* I have made from my original drawings.